WHAT IS CLAIMED IS:

1. A 3D image acquisition apparatus comprising:

a pattern projection section which projects a predetermined pattern on an object;

an imaging section which is disposed at a predetermined distance from said pattern projection section and images the object on which the predetermined pattern has been projected; and

a depth calculation section which detects the projection pattern projected on the object on the basis of an image acquired by said imaging section, collates the detected projection pattern and the predetermined pattern projected by the pattern projection section, and calculates a depth of respective parts of the object on the basis of the correspondency of the collation,

wherein the predetermined pattern projected by said pattern projection section is formed by alternately arranging areas with local maximum luminance values and areas with local minimum luminance values.

2. A 3D image acquisition apparatus comprising:

a pattern projection section which projects a predetermined pattern on an object;

an imaging section which is disposed at a predetermined distance from said pattern projection section and images the object on which the

predetermined pattern has been projected; and

a depth calculation section which detects an image pattern on the basis of an image acquired by said imaging section, collates the detected image pattern and the predetermined pattern projected by the pattern projection section, and calculates a depth of respective parts of the object on the basis of the correspondency of the collation,

wherein the predetermined pattern projected by said pattern projection section is formed by combining patterns of a plurality of color components, and the patterns of the plurality of color components are formed by alternately arranging areas with local maximum luminance values and areas with local minimum luminance values.

3. A 3D image acquisition apparatus according to claim 2,

wherein in the patterns of the plurality of color components, positions of the areas with local maximum luminance values and positions of the areas with local minimum luminance values are aligned.

4. A 3D image acquisition apparatus according to claim 2,

wherein in the patterns of the plurality of color components, positions of the areas with local maximum luminance values and positions of the areas with local minimum luminance values are shifted.

5. A 3D image acquisition apparatus according to claim 2,

wherein the position of the area with the local maximum luminance of the pattern of at least one of the color components is aligned with the position of the area with the local minimum luminance of the patterns of the other color components.

6. A 3D image acquisition apparatus according to claim 2, 3 or 4,

wherein said plurality of color components are RGB components.

7. A 3D image acquisition apparatus according to any one of claims 1 to 4,

wherein the projected predetermined pattern is a stripe pattern or a matrix pattern.

8. A 3D image acquisition apparatus comprising:

a pattern projection section which projects on an object a spatial encoding pattern in which blocks or areas with local maximum and minimum luminance values are alternately arranged and encoding is effected by combining local maximum/minimum information and gradation information;

a pattern memory which stores the pattern that is projected by the pattern projection section;

a light reception section which receives light reflected by the object;

an image memory which stores information of the

light received by the light reception section;

a depth calculation section which calculates depth information of the object on the basis of the pattern stored in the image memory and the pattern stored in the pattern memory;

a 2D image information generating section which generates 2D image information on the basis of the information stored in the image memory; and

a 3D image generating section which generates a 3D image on the basis of the 2D image information generated by the 2D image information generating section and the depth information calculated by the depth calculation section.

9. A 3D image acquisition apparatus according to claim 8,

wherein said 3D image acquisition apparatus has a plurality of said light reception sections and a plurality of said image memories,

and further includes a correspondency determination section which matches the contents of the image memories and collates the images,

the depth calculation section calculates 3D information of the object on the basis of information determined by the correspondency determination section, and

said 3D image section generates a 3D image on the basis of information generated by the 2D image

information generating section and the value calculated by the depth calculation section.

10. A 3D image acquisition method comprising:

a step of projecting a predetermined pattern on an object;

a step of imaging the object on which the predetermined pattern has been projected, at a position at a predetermined distance from a position where the predetermined pattern has been projected; and

a step of detecting a pattern on the basis of an image acquired by said imaging step, collating the detected pattern and the pattern projected by said pattern projection step, and calculating a depth of respective parts of the object on the basis of the correspondency of the collation,

wherein the predetermined pattern projected by said pattern projection step is formed by alternately arranging areas with local maximum luminance values and areas with local minimum luminance values.

11. A 3D image acquisition method comprising:

a step of projecting a predetermined pattern on an object;

a step of imaging the object on which the predetermined pattern has been projected, at a position at a predetermined distance from a position where the predetermined pattern has been projected; and

a step of detecting a pattern on the basis of

an image acquired by said imaging step, collating the detected pattern and the pattern projected by said pattern projection step, and calculating a depth of respective parts of the object on the basis of the correspondency of the collation,

wherein the predetermined pattern projected by said pattern projection step is formed by combining patterns of a plurality of color components, and the patterns of the plurality of color components are formed by alternately arranging areas with local maximum luminance values and areas with local minimum luminance values.

12. A 3D image acquisition method, to which applied is a spatial pattern encoding method wherein blocks or areas with local maximum and minimum luminance values are alternately arranged and a predetermined code pattern is generated by combining local maximum/minimum information and gradation information.

13. A 3D image acquisition method according to claim 12,

wherein the code pattern obtained by the spatial pattern encoding method is a stripe pattern or a matrix pattern.

14. A 3D image acquisition method according to claim 12,

wherein the code pattern obtained by the spatial

pattern encoding method is encoded in substantially independent wavelength bands such as R, G and B.

15. A 3D image acquisition method according to claim 14,

wherein blocks or areas with local maximum luminance values and local minimum luminance values of R, G and B are aligned.

16. A 3D image acquisition method according to claim 14,

wherein blocks or areas with local maximum luminance values and local minimum luminance values of R, G and B are shifted.